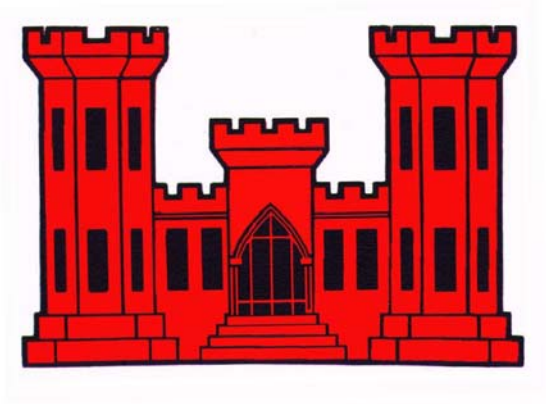

United States Army Corps of Engineers

Proposed Center Hill Dam Seepage Rehabilitation

Environmental Assessment Supplement 1

DeKalb County, Tennessee
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1.0 INTRODUCTION

The US Army Corps of Engineers (Corps) is studying alternatives to stop leakage of Center Hill Dam (CEN). This study is being conducted under the Center Hill Project's original authority. The Center Hill project was authorized by the Flood Control Act approved June 28, 1938 (Public No. 761, 75th Congress, 3d session).

In July, 2005, an Environmental Assessment (EA), evaluating grouting alternatives to control the seepage, was completed. That EA resulted in a Finding of No Significant Impact (FONSI) signed on July 17, 2005. The preferred alternative as listed in that EA and signed FONSI is to inject grout in a grout line on both sides of the dam (see Figure 1).

During the design of the grouting alternative, a more effective remediation treatment was identified. Therefore a Supplemental EA is being prepared.

Existing conditions, alternatives to the proposed action, and potential impacts of proposed alternatives as related to the proposed project areas are presented in this Environmental Assessment (EA). The EA was prepared pursuant to the National Environmental Policy Act (NEPA), Council for Environmental Quality (CEQ) regulations (40 CFR, 1500-1517), and the Corps implementing regulation, Policy and Procedures for Implementing NEPA, ER 200-2-2, 1988.

In accordance with CEQ regulations, 40 CFR Chapter V Section 1502.21, the following NEPA document is incorporated by reference and only pertinent information is summarized from these documents to provide an understanding of the current proposed alternatives: Proposed Center Hill Dam Seepage Rehabilitation Environmental Assessment; U.S. Army Corps of Engineers, Nashville District; July 2005. Duplication of previous information will be minimized as much as possible. The complete documents are available for review at the Corps' Nashville District Office.

2.0 PURPOSE AND NEED FOR ACTION

2.1 Background

In the early part of the 20th century, major floods occurred in the Ohio and Mississippi River Basins, resulting in disastrous losses of lives, property, and economic stability. Public demands for government agencies to take protective measures, led to the Corps' development of a comprehensive flood control plan in 1937. The comprehensive plan proposed construction of 45 flood control reservoirs in the Ohio River basin. Six flood control reservoirs were recommended for the Cumberland River, four of which were eventually built. These four projects are Wolf Creek (Lake Cumberland), Dale Hollow, Center Hill, and J. Percy Priest Dams.

CEN was authorized by the Flood Control Act of 1938 (Public Law 761, 75th Congress, 3rd Session) and the Rivers and Harbors Act of 1946 (Public Law 525, 79th Congress, 2nd Session). Center Hill Lake's primary purposes are hydroelectric power production and flood control. Other public interest purposes such as the conservation of fish and wildlife resources are also authorized. The dam is located at mile 26.6 on the Caney Fork River near Smithville, Tennessee and was completed for flood control operation in 1948. At normal recreational pool, water surface covers approximately 18,000 acres.

2.2 Purpose and Need

CEN has a long history of foundation seepage problems through both the right abutment and left rim due to large solution features (caves) within the limestone formations. The risk for dam failure will exist until the seepage problems are addressed.

3.0 DESCRIPTION OF ALTERNATIVES

There are three alternatives available to the Corps:

1) **No Action.** All current operations would continue and no construction or rehabilitation would take place. The Dam would eventually fail. The failure could be slow, allowing time for a controlled release to empty the reservoir or it could be sudden. A sudden dam breach failure would be catastrophic. In addition to the potential loss of lives, damages would be excessive and would entail severe disruptions throughout the Cumberland River Basin. Although this alternative is unacceptable, it will be evaluated throughout this document to serve as a comparative baseline and to comply with NEPA which mandates that the "No Action" alternative be considered.

2) **Grouting.** This option would consist of forcing grout into the ground in order to form an impenetrable wall below the surface. Grouting could be a combination of hot bitumen and conventional cement grout or the conventional grout only. The grout would be injected separately into two drilled grout lines on 20-foot centers at depths of approximately 300 feet.
   Right Abutment: The grout-line would begin close to the dam and would travel along an access road toward the existing saddle dam. The line would be approximately 3,700 linear feet in length and 190 feet to 400 feet deep. A grout production plant would be located in an existing parking and staging area located adjacent to the saddle dam also in an existing disturbed area.
   Left Abutment: The grout-line would follow an existing access road. It would be approximately 2,120 linear feet in length and 190 feet deep. A staging area would be located in areas 1 or 2 (see Map). Both areas are previously disturbed and or existing cleared areas. Access roads would be widened

   In the emergency of rapid erosion of solution features, the lake may need to be drawn down to stop seepage. The lake would be drawn down to approximately 625 msl. The lake would be drawn down until the seepage pathways could be grouted.

   Areas for staging and/or disposal will be located in areas previously disturbed or already cleared of vegetation (see figure 1).

3) **Grouting and Cut-Off Walls.** This option would consist of everything in Alternative 2, in addition, cut-off walls would

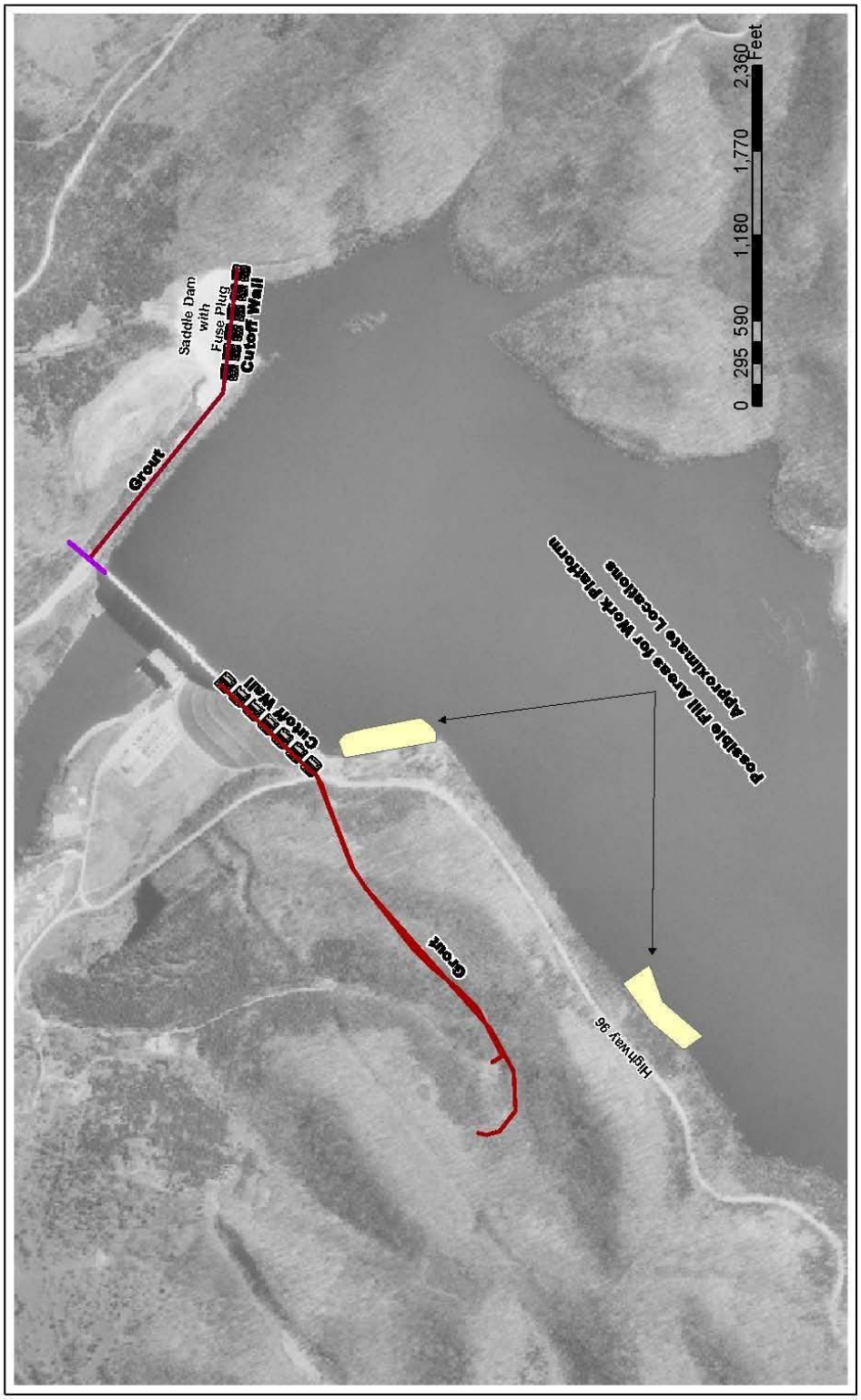
be constructed along the earthen embankment and across the fuse-plug (saddle dam) (see Figure 2). This is a continuous concrete wall intended to cut off seepage that could move through the rock foundation. It is constructed using panels or piles or a combination of both. The larger panels can be excavated through the clay earthen material to the top of rock. Then a rotating drill bit is required to cut through the harder rock. Both the panels and the piles are overlapped to form a continuous wall unit into the foundation rock. Coffer dams would be temporarily placed adjacently upstream to the saddle dam for safety reasons. Once construction was complete, the coffer dams would be removed. Disposal material would be placed in areas that were previously used for disposal during the construction of the dams or to fill existing sink holes. A work platform approximately 1 acre in size would be required for construction. Two locations were originally considered (see Figure 2). One location was eliminated from further consideration because of longer distances to travel between the work platform and the dam site. Only the site close to the earthen portion of the dam will be further considered. This is the preferred alternative.

Alternatives 1, 2, and 3 are considered throughout this Environmental Assessment as a basis of comparison for potential impacts. Other alternatives that were considered in the July 2005 Proposed Center Hill Dam Seepage Rehabilitation Environmental Assessment were Lower the Lake Level and Dam Removal.

Figure 1. GROUTING ALTERNATIVE AND DISPOSAL AREAS

Possible Disposal Areas

Figure 2. GROUTING AND CUT-OFF WALLS ALTERNATIVE



4.0 AFFECTED ENVIRONMENT

4.1 Physiography

Center Hill Reservoir is located within two physiographic provinces of Central Tennessee designated as the Central Basin and the Highland Rim.

The Central Basin is a nearly elliptical area enclosed by the Highland Rim. The Central Basin was formed by erosion of the Nashville Dome, a low structural dome that makes up the structural and geographic center of the Basin. The dome represents the southern end of the Cincinnati Arch, an elongated area of upwarped rocks that extend into Tennessee. During the upwarping and doming, the rocks at the crest of the dome were stretched, resulting in the formation of joints. The weakened carbonate rocks were readily subject to solution and erosion, resulting in a topographic basin that now occupies the top of the structural dome. The Basin is characterized by calcium carbonate sedimentary rocks of Ordovician age. These sedimentary rocks comprising the Central Basin include limestone, shale, dolomite, siltstone, sandstone, and claystone.

The Highland Rim is a ring-shaped hilly upland completely encircling the Central Basin. It stretches from the western margin of the Cumberland Plateau southward and westward as far as Kentucky Lake. Terrain is a level to rolling plateau with soil cover varying from 20 to 100 feet thick. Bedrock is flat-lying limestone of Mississippian origin. Numerous rock outcrops and sinkholes are present in this region. Sinkholes are formed by the collapse of underground cavities dissolved out of limestone by the flow or percolation of subsurface water streams and seepages. In areas where such sinks are common, the terrain is referred to as karst topography.

4.2 Recreation

Recreation was not originally an authorized project purpose. The Federal Water Project Recreation Act of 1965 established development of the recreational potential at federal water resource projects as a full project purpose. Recreation has become a major factor in the regional economy. Because of the temperate climate control and relatively long recreation season, visitors have many opportunities to fish, hunt, camp, picnic, boat, canoe, hike, and enjoy the outdoors. Center Hill Lake supports eight recreation areas, 15 minor access areas, four campgrounds, nine marinas, two group camps, three state parks,

and seven picnic areas with 214 picnic sites. An estimated 2.9 million people visit the lake annually, generating approximately 82.7 million dollars in recreational benefits.

The most noteworthy attributes of the tailwaters are their aesthetic qualities and recreational potential. Recreational fishing and boating, particularly trout fishing and canoeing, are by far the major activities accounting for visitation.

4.3 Historic Properties

Section 106 of the National Historic Preservation Act requires Federal agencies to take into account the effect of their undertakings on historic properties, properties that are considered eligible for or listed on the National Register of Historic Properties. Regulations at 36 CFR 800 define a process for taking such effects into account. Center Hill Dam, and the facilities associated with this structure are considered potentially eligible for listing on the National Register of Historic Places. No additional historic properties have been identified in the project's "area of potential effects."

4.4 Socio-Economic Resources

The population of DeKalb County in 2000 was 17,243. DeKalb County maintains a relatively diversified employment base with manufacturing, education, health care and retail trade as the primary industries in terms of employment. Other major industries include accommodation and food services, administration and support services, construction, wholesale trade, and transportation. As of 2000, the total civilian labor force in the county was 8,424; unemployment rate was 3.2% (3.5% average for Tennessee). As of 1999, the per capita income level in DeKalb County was $17,217 ($19,393 average for Tennessee). The percent of persons living below the poverty level in DeKalb County in 1999 was 17% (13.5% average for Tennessee). In 2000, less than 5% of the county population is considered minority.

It appears that there are many acres in the watershed used for agriculture such as cattle grazing and hay production. According to the 2000 census data, 2.1% of the 16 years of age and over population within DeKalb County has an occupation classified as Farming, fishing, and forestry.

CEN is a significant economic factor in the region. In addition to the recreation, hydropower, and flood damage reduction benefits discussed above, the dam provides many other advantages

including municipal water supply, increased property values, increased tax revenues, and employment opportunities.

The dam has prevented significant flood related damages over the years. The level of safety provided by the dams has encouraged the development of communities and businesses along the rivers. In addition, the relatively inexpensive and dependable electricity provided by the power plant has contributed to the region's economic well-being. CEN annually generates approximately 381,000 MWH worth about $5.3 million. Although recreation was not originally an important consideration and was not an authorized project purpose until passage of the Federal Water Project Recreation Act of 1965, it has become a major economic factor in the region.

Center Hill Reservoir currently supports 3 separate water intakes. All together, they can withdraw up to 21,592,000 million gallons per day (MGD). These intakes supply water to the cities of Cookeville and Smithville Cities, and Riverwatch Golf, Inc.

4.5 Aquatics

Center Hill Reservoir contains mainly a warm-water fishery. Major game species include: black bass (*Micropterus spp.*), sunfish (Family *Centrarchidae*), walleye (*Stizostedion vitreum*), and catfishes (*Ictalurus spp.*). Center Hill is a deep, clear lake that undergoes strong thermal stratification from mid-spring until mid-fall. During stratification depletion of dissolved oxygen (DO) occurs below the epilimnion. DO levels are too low to sustain life below the epilimnion at certain times of the year. Tennessee Wildlife Resources Agency (TWRA) has primary responsibility for fisheries management at Center Hill Reservoir.

The CEN tailwater extends 26 miles from the Dam at Caney Fork River Mile 26.6 to the mouth of the Caney Fork River at its confluence with the Cumberland River. The Caney Fork River is characterized by a series of oxbow bends with the inside semicircular tips relatively flat and the outside banks quite steep and often vertical. The width of the channel averages 250 feet. Pool and shoal areas are well defined during non-generation and low-flow periods but are hidden during higher flow periods. The streambed is comprised of bedrock and gravel beds. River banks range up to 30 feet in height, are relatively stable, and support a wide variety of plant growth.

The cold water released through the turbines at CEN and the non-release leakage flow around and through the dam creates conditions favorable to the maintenance of a trout fishery in the Caney Fork River. Many of the native aquatic species in the tailwater have been extirpated due to the cold water temperature. To mitigate for the loss in recreation, TWRA and the U.S. Fish and Wildlife Service have annually provided trout in this reach of the Caney Fork River. The river has an artificial fish community mostly comprised of trout, shad, and carp. Walleye, white bass, yellow bass, striped bass, redhorse and buffalo are also observed seasonally (Fiss and Young, 2003).

The trout population below CEN is maintained by stocking. The following excerpt is reported by TWRA in the Management Plan for the Center Hill Tailwater Trout Fishery 2004-2009:

> *In recent years the number of 9-inch rainbow trout stocked averaged 115,000 annually (Figure 3). These "catchable" rainbows are stocked at rate of 3,000 to 15,000 per month and sustain a put-and-take fishery. "Put-and-take" describes a fishery where fish are stocked at a large enough size to be immediately harvested by anglers. Fingerling rainbow trout have also been stocked in recent years (Figure 3). The stocking rate of brown trout has varied from 17,000 to 70,000 (Figure 4). Traditionally brown trout were stocked at 6-8 inches in early summer. In 1999, TWRA shifted to a fall stocking of 4-inch brown trout as suggest by Devlin and Bettoli (1999). Brown trout support a "put-and-grow" fishery as these fish need time to grow into desirable sizes.*

4.6 Terrestrial Resources and Land Use

The Center Hill Reservoir can be characterized as having a mixed mesophytic deciduous forest vegetation type. Forest community classifications for the Center Hill area include upland hardwoods, red cedar stands, cove hardwoods and wetlands.

Surrounding areas are labeled as an oak-hickory complex interspersed with Eastern red cedar. Trees common to the area include oaks (*Quercus spp.*), hickories (*Carya spp.*), yellow poplar (*Liriodendron tulipifera*), black walnut (*Juglans nigra*), white ash (*Fraxinus Americana*), hackberry (*Celtis occidentalis*), elms (*Ulmus spp.*), American beech (*Fagus grandifolia*), and blackgum (*Nyssa sylvatica*). Common understory species

associated with this type include flowering dogwood (*Cornus florida*), black cherry (*Prunus serotina*), redbud (*Cercis Canadensis*), and persimmon (*Diospyros virginiana*).

Lands surrounding Center Hill Reservoir are managed to promote beneficial habitat conditions for both game and non-game species of wildlife. Present conditions are most favorable to species such as white-tailed deer (*Odocoileus virginianus*), wild turkey (*Meleagris gallopavo*), squirrel (*Sciurus spp.*) and other animals associated with mature forest habitat.

Seven state-listed species are known to occur within a 1-mile radius of the project area, Price's potato bean (*Apios priceana*), Cerulean warbler (*Dendroica cerulea*), Svenson's wild-rye (*Elymus svensonii*), Harper's umbrella-plant (*Eriogonium longifolium var. harperi*), Western wallflower (*Erysimum capitatum*), fen orchis (*Liparis loeselii*), and nodding rattlesnake-root (*Prenanthes crepidinea*). Three of the above species have been identified close to the project area, Harper's umbrella plant, fen orchis, and Svenson's wild-rye.

4.7 Threatened and Endangered Species

According to a US Fish and Wildlife Service (USFWS) letter dating May 18, 2004, USFWS stated that the Price's potato bean (*Apios priceana*) and the gray bat (*Myotis grisescens*) may be located within the area of potential effect.

The solution features (caves) within the project area are directly connected with the reservoir as determined by temperature profiles, jointing, dye traces, and flow response to lake elevation changes. A majority of the time these caves have water flowing through the open spaces. It would be highly unlikely to serve as roosting habitat for the gray bat. Many of the solution features were formed by the increased water pressure resulting from the reservoirs construction.

According to a phone conversation on February 7, 2005 with the USFWS, Price's Potato Bean is most likely not located within the area of potential effect.

4.8 Wetlands

No wetlands are identified within the proposed project boundaries.

4.9 Hazardous, Toxic and Radioactive Waste (HTRW)

No known HTRW sites are within the proposed project area.

5.0 ENVIRONMENTAL CONSEQUENCES

5.1 Physiography

5.1.1 Alternatives 1 (No Action)

No significant impacts to physiography would occur with the No-Action alternative.

5.1.2 Alternative 2 (Grouting)

Minor effects would be possible from Alternative 2. Grouting would be utilized to stop water flow through solution features (caves). Grouting would fill these cave systems. Reshaping to topographic contours due to the formation of sinkholes would not occur as quickly. There would also be some minor reshaping of contour lines from possible disposal of excavated material.

5.1.3 Alternative 3 (Grouting and Cut-off Walls)

In addition to the minor effects mentioned in alternative 2, Alternative 3 would include creating a work pad along the left bank of Center Hill Lake (see Figure 2). Creation of this pad would require placing a large quantity of rock fill within the reservoir, along the shoreline. The addition of this fill would be a minor reshaping of the topography.

5.2 Recreation

5.2.1 Alternative 1 (No Action)

The No Action alternative, which would result in the loss of the lake, would have severe impacts on recreation. Most of the approximate 110.1 million spent on recreation in the region annually would be lost.

5.2.2 Alternative 2 (Grouting)

This alternative would help to increase the life of the Dam and the lake, therefore, ensuring continued recreational opportunities.

5.2.3 Alternative 3 (Grouting and Cut-off Walls)

In addition to the impacts of alternative 2, this alternative would have temporary negative impacts to Center Hill Park, a

Corps Recreation Area. The area would have to be closed to the public during construction time. After construction, the construction work pad may be left in place and therefore provide a larger flat area for recreation. An improved launching ramp, used for construction, would be left for recreational use.

5.3 Historic Properties

5.3.1 Alternatives 1 (No Action), 2 (Grouting), and 3 (Grouting and Cut-off Walls)

A single historic property, Center Hill Dam and associated facilities, is located within the project's "area of potential effects." In response to initial project scoping the Tennessee State Historic Preservation Officer (SHPO) noted that the proposed undertaking may affect historic properties. Consequently, and in accordance with requirements at 36 CFR 800.5, an assessment of adverse effects was conducted by the Corps. An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of an historic property that qualify the property for inclusion in the National Register of Historic Places. Applying the criteria of adverse effect, the Corps concluded that the proposed activities would have no adverse affect on Center Hill Dam. This finding was provided to the Tennessee State Historic Preservation Officer (SHPO) by letter dated February 10, 2006. The SHPO concurred with the Corps' finding by letter dated February 15, 2006.

5.4 Socio-Economic Resources

5.4.1 Alternative 1 (No Action)

No Action would have a severe impact on the regional and national economics.

Because the No Action alternative results in the loss of pool, it would no longer be possible to generate hydropower. If a catastrophic failure of the dam resulted, there could be damages that run into the billions of dollars. Because of the possible loss in ability to reduce flood damages, downstream areas could expect to accrue damages of about 16.8 million per year.

In addition, jobs would be lost, property values around the lake would decline and the associated property tax revenues would shrink. Community and regional growth would be disrupted. People and businesses would be displaced, and there would be an

overall decline in public services and facilities. As noted above, future flood damages from the loss or closure of the dam would result in millions of dollars in damage, annually. Also, if the reservoir was lost, the three water intakes at Center Hill mentioned above would be unable to operate, leaving two cities and a golf course without water supply.

5.4.1 Alternative 2 (Grouting) and 3 (Grouting and Cut-off Walls)

This alternative would help sustain all existing economic benefits that CEN currently provides. There could be an indirect impact to socio-economics if a wash-out of cement grout were to occur. A wash-out might cause a significant change in the pH of the CEN tailwaters. Significant changes in the pH could cause a major fishkill which would result in lost recreational fishing benefits. However, according to research, cement/bitumen grouting almost never washes out (Schonian and Naudts, 2003). Also, protective measures to prevent a wash-out of grout would be in place prior to starting the grouting operation. These protective measures will be determined. There would likely be positive economic benefits for local businesses resulting from an influx of construction workers for the proposed project.

5.5 Aquatics

5.5.1 Alternative 1 (No Action)

The No Action alternative would eventually result in loss of the dam and the pool behind it. As the dam failed, large quantities of the earth embankment could be expected to wash downstream with negative impacts to water quality. In addition, more than 50 years of accumulated sediment that has settled behind the dam would be released to flow downstream. The exposed lake bottom, which is currently devoid of vegetation would also begin to erode and would contribute to the damages. The immediate effects would be devastating to points downstream of the dam. After the lake returned to a river environment, it is expected that the cold water regime would revert to its original warm water conditions. The trout fishery would no longer be sustainable.

The severe impacts from water quality changes described above, would temporarily eradicate most fish from the main river channel. These impacts would likely extend downstream at least

through the Old Hickory Reservoir. Old Hickory would likely act as a settling basin for sediments to fall out of the water column. A large fish kill could be anticipated including all of the trout. Native warm water species would slowly return as the temperature regime changed, but the healing period would be lengthy.

5.5.2 Alternative 2 (Grouting)

The grouting alternative would benefit water quality by preventing large, uncontrolled flows such as existed prior to the dam's construction and the attendant shoreline erosion and sedimentation produced by such events. Large amounts of sediment associated with a dam failure would also be avoided.

With the grouting alternative, there is a possibility of a wash-out into the tailwaters. However, it almost never happens with bitumen grout (Schonian and Naudts, 2003). If there was a wash-out of grout there would be no major changes in water quality from the bitumen. However, a wash-out of cement grout would cause increases in pH. Fish kills would be likely. Therefore, protective measures to stop the grout from entering the tailwaters would be in place prior to the injection of grout.

Existing seepage from the dam currently provides approximately 90 cfs when all spill operations are stopped. Therefore some minimum flows are provided. If Alternative 2 (grouting) is chosen, these minimum flows would be stopped, therefore, causing an adverse impact to water quality and aquatics below CEN.

If alternative 2 is chosen, mitigation for loss of minimum flows would be required in order to reduce adverse impacts to an insignificant level. Appropriate mitigation would be the replacement of the existing house unit generator.

A minimum flow study was carried out in 2004 in order to determine ideal flows for Caney Fork located below Center Hill Dam. It was determined in that study that a minimum flow of 200 cfs would be ideal to reach maximum overall trout habitat, while maintaining good wadeability for fisherman (Hauser, 2004). A new house unit would be designed to provide a minimum flow of 200 cfs.

If the lake was drawn down, in the event of an emergency, it would be drawn down from the normal winter pool level of 634 msl to 625 msl. This would cause an exposure and drying of wetted habitat areas. However it would be temporary and once the

seepage was stopped, the lake would be returned to its historical levels.

5.5.3 Alternative 3 (Grouting and Cut-off Walls)

In addition to the impacts mentioned in alternative 2, there would be an additional minor amount of aquatic habitat lost or impacted. There would be a permanent loss of littoral (area near the reservoir banks) habitat within the footprint of the proposed contractor work-pad (approximately 1 acre). There would be a temporary minor impact to aquatic habitat within the coffer dam areas.

5.6 Terrestrial Resources

5.6.1 Alternative 1 (No Action)

The impacts the No Action alternative would have on forests and vegetation would depend greatly on how the dam failed. A controlled drawdown and return to river conditions would have little impact on the forest or local vegetation. However due to the drawdown, significant amounts of land would be available to revert to forested conditions. A worst-case catastrophic failure would be devastating to the riparian zone throughout the Caney Fork River downstream of CEN. Much of the riparian vegetation would be lost or covered in silt deposition.

5.6.2 Alternative 2 (Grouting) and Alternative 3 (Grouting and Cut-off Walls)

All grouting and cut-off wall routes would require some loss of vegetation. However route 1 on both the left and right banks would be located on existing construction roads. These roads would require minor clearing in order to widen the road for equipment. Once the roads were cleared asphalt may be used to make the roads more maintainable for the future. There would be a minor amount of habitat permanently lost. Staging areas for both equipment and disposal would be located in previously disturbed and cleared areas (see Figure 1). Areas that had been used in the past have been somewhat re-vegetated. These areas are mainly open areas with scattered, early succession hardwoods. They would likely be cleared; therefore, there would be a temporary loss of habitat until the area again re-vegetated. The proposed work-pad of alternative 3 would cause a temporary land disturbance, within a previously disturbed recreational area.

The State-listed plant species would be, if possible, caged-off in areas where construction would be close by. Coordination with the Tennessee Division of Natural Heritage would be requested in order to locate individuals in order to place exclusion cages around them. Individuals that could not be caged and were in direct paths of construction would be lost. This loss should be temporary and the areas of construction would stabilize and re-populate.

5.7 Threatened and Endangered Species

5.7.1 Alternative 1 (No Action)

There would be possible adverse effects to federally listed species. If there were a dam failure, high water flows could wash away Price's potato bean, destroy gray bat foraging habitat, and affect federally-listed aquatic species within the Caney Fork and Cumberland Rivers. Also, sediments released from the reservoir and eroded from the river banks would likely smother many federal aquatic species.

5.7.2 Alternative 2 (Grouting) and Alternative 3 (Grouting and Cut-off Walls)

According to a February 7, 2005, phone conversation with the USFWS, the Price's Potato Bean is most likely not located within the area of potential effect. Therefore, a BA will not be prepared for this species.

The gray bat roosts only in caves or cave-like habitats. There are caves located within the area of potential effect. The grouting alternative would affect some of these caves; however these caves do not fit the characteristics of the summer roosting or winter hibernation habitat of the gray bat. The caves or solution features that would be affected by grouting have water flushing through them, originating from the reservoir. Therefore, a BA will not be prepared for this species. There are no effects to federally listed species anticipated.

5.8 Wetlands

5.8.1 Alternatives 1 (No Action) and 2 (Grouting)

Wetlands would not be affected by implementation of the proposed action as there were no wetland sites identified in the area of potential effect.

5.9 Hazardous, Toxic and Radioactive Waste

5.9.1 Alternatives 1 (No Action) and 2 (Grouting)

There are no known HTRW sites in the area of potential effect. No Impacts would occur.

5.10 Cumulative Impacts

Cumulative impacts would result from the incremental impact of the proposed action when added to those of other past, present and reasonably foreseeable future actions in the local area. Geographical boundary for this discussion of cumulative impacts is the Caney Fork River and the Center Hill Reservoir watersheds. Temporal boundaries established span from reservoir impoundment (1948) to fifty years future projection.

Past and Present Actions

Virtually all lands suitable for agriculture in the Caney Fork River Valley have been utilized for that purpose since settlement in the early nineteenth century. When Center Hill Reservoir was constructed, many acres of these lands were inundated. The hills too steep for cultivation or pasture were allowed to remain forested; usable timber was harvested from the areas periodically. However, no timber has been harvested from Corps' lands since their conversion. Early commercial use of the river was for transportation of merchandise by boat and floating log rafts to downstream markets. The populations of surrounding Putnam and DeKalb Counties have increased significantly in the last 40 years. Between 1960 and 2001, the combined county's population has doubled from 40,010 to 80,431.

The goal of land management at Center Hill Reservoir is to prevent private exclusive use of public lands and waters in favor of conserving the natural environment of the shoreline for use by the general public. However, with the increase in populations there have been many new residential and commercial

properties added to the areas surrounding the lake. The rise in population has also led to an increase in visitation to the lake. This adds to pollutants and disturbance to the projects and surrounding lands.

Reasonably Foreseeable Future Actions

Population increases will continue. This will continue to add to the need for new residential and commercial development. Surrounding land uses might convert from agriculture and rural uses to more developed residential areas. This may cause additional water quality issues from run-off and sedimentation. The importance of Federal lands for being a vegetative buffer between development and the lake may rise. There may be an increase in water supply requests due to an increase in development. Also, with the increase in population, there could be an increase in demand for recreation. There has been concern that the lake is reaching recreational carrying capacity, however there is no study evidence to support the concern.

The Corps is currently conducting a major rehabilitation study to replace the existing generators at Center Hill Dam with modern units. In addition, the study is looking for ways to improve water quality in the tailwaters. This could cause major beneficial changes for the tailwaters in the future. If the trout fishery is improved along with the water quality there may be an increase in demand by fishermen.

Incremental Impacts as a result of the Proposed Project

As a result of a successful seepage rehabilitation project, the dam and reservoir will continue to provide the benefits for which it was built. It will continue to be a source of hydropower generation, water supply, and flood control. Center Hill will continue to provide recreation benefits and will add to tourism, providing many benefits to the local economy.

6.0 ENVIRONMENTAL COMMITMENTS AND COMPLIANCE

6.1 Clean Water Act

Compliance with Section 404 of the Clean Water Act is required for discharges of dredged or fill material into waters of the United States, including adjacent wetlands. Typical activities requiring Section 404 permits include: site development fill for residential, commercial, or recreational developments, construction of revetments, groins, breakwaters, levees, dams, dikes, weirs, and intake structures, and placement of riprap and road fills.

Protective measures will be in place to prevent any discharges into the tailwaters of Center Hill Dam. There will be approximately 162,000 cubic yards of rock for a work-pad. Also, coffer dams will be placed adjacently upstream from the fuse plug (see Figure 2).

A Preliminary 404 (b)(1) Evaluation was prepared and Public Notice # PM-P-06-01, dated March 15, 2006 is being circulated. Copies of each of these are in Appendix B. State 401 Water Quality Certification has been requested from the TDEC for this work.

6.2 Floodplain Management

Executive Order (EO) 11988 (May 24, 1977) outlines the responsibilities of Federal agencies in the role of floodplain management. In accordance with this EO, the Corps is required to evaluate potential effects of actions on floodplains, and does not undertake actions that directly induce growth in the floodplain, unless no practical alternative exists. Construction of structures and facilities on floodplains must incorporate flood proofing and other accepted flood protection measures. This project would not result in induced growth in the floodplain. Any negative impacts upon the floodplain would be insignificant.

6.3 Fish and Wildlife Coordination Act

The Corps is required to coordinate with the United States Fish and Wildlife Service (USFWS) and the Tennessee Wildlife Resource Agency (TWRA) under the Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 USC 661 et seq.). The

draft EA is being coordinated with the USFWS Field Office in Cookeville, TN and with TWRA.

6.4 Endangered Species Act

The draft EA is being coordinated with the USFWS Field Office in Cookeville, TN.

6.5 Cultural Resource Requirements

The National Historic Preservation Act requires Federal agencies to take into account the affect of their undertakings on historic properties. The Act also requires Federal agencies to provide the Advisory Council on Historic Preservation an opportunity to comment on undertakings through the process codified in the Council's regulations (36 CFR 800). Effects on historic properties were addressed in accordance with these regulations and in consultation with the Tennessee State Historic Preservation Officer.

The Tennessee State Historic Preservation Officer stated in a letter dated February 15, 2006, that the proposed project will not adversely affect any property that is eligible for listing in the National Register of Historic Places.

6.6 Environmental Justice

Executive order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations, was signed on February 11, 1994. The order requires Federal agencies to promote “nondiscrimination in Federal programs substantially affecting human health and environment”. In response to this directive, Federal Agencies must identify and address disproportionately high and adverse human health and environmental effects of their programs, policies, and activities on minority and low-income populations. This project would not affect any social or economic group differently from another. The conclusion for this proposed project is that low-income or minority populations would not be disproportionately affected by the proposed activity.

6.7 Hazardous, Toxic and Radiological Waste

No hazardous, toxic, and radiological wastes were revealed during site testing.

6.8 Underground Injection

Class V injection wells are typically shallow disposal systems that are used to place a variety of fluids below the land surface. They are currently regulated by Environmental Protection Agency (EPA) and through the states Under Ground Injection (UIC) program, under the authority the Safe Drinking Water Act (40 CFR 144). Grouting at Center Hill would require a Class V injection well permit from the Tennessee Department of Environment and Conservation, Division of Water Supply. This permit will be acquired prior to construction.

6.9 Environmental Commitments

Protective measures to insure that no grout washes out into the tailwaters will be in place prior to any grout injection.

A new house unit generator capable of releasing 200 cfs would be in place prior to grout injection to mitigate for the loss of minimum flows.

Coordination with the Division of Natural Heritage will be initiated to survey for state-listed plant species prior to construction. If needed, exclusion cages will be used in order to protect individuals from construction activities.

General Construction Best Management Practices (BMPs), as described in the Tennessee Erosion and Sediment Control Handbook, will be followed throughout the construction process. Copies of the handbook can be found on the web at: http://www.state.tn.us/environment/wpc/sed_ero_controlhandbook/

7.0 SCOPING AND PUBLIC CONCERN

7.1 Public Involvement

Efforts have been made to determine significant issues related to the proposed project. A scoping letter was sent out for a 30-day review to the agency and members of the public listed in Appendix A.

7.2 Scoping Responses

Comments from the scoping process were received from the following agencies or persons (see Appendix A). Also below, are summaries of their comments and the Corps' response.

1) Tennessee Historical Commission (THC): *Considering available information, we concur that the project will not adversely affect any property that is eligible for listing in the National Register of Historic Places. Therefore, this office has no objection to the implementation of this project.*

   Corps' Response: *Concur*

2) Tennessee Division of Underground Storage Tanks: *According to our files, no [underground storage tanks] UST systems are located in the work areas indicated.*

   Corps' Response: *Concur*

3) Tennessee Recreation Educational Services: *After a research of our office's files, we can locate no occasion where a grant administered by this division would be impacted by the proposed dam rehabilitation at Center Hill Dam. Therefore, we have no involvement in the subject area from a state or federal level.*

   Corps' Response: *Concur*

4) Tennessee Wildlife Resources Agency: *"Center Hill Reservoir and the Caney Fork River provide valuable fishery resources to the citizens of Tennessee. TWRA is concerned that when the proposed rehabilitation measures are complete there will be a loss of continuous in-stream flow associated with these seepages that may impact the trout fishery below Center Hill Dam. During the NEPA process to determine alternatives to rehabilitate the dam, mitigation for potential impacts to the*

existing valuable trout fishery due to the loss of these in-stream flows should be included in this process.

Corps' Response: *Concur. Mitigation in the form of a new house unit generator will be in place prior to construction (please see 5.5.2 alternative 2 and 3)*.

8.0 CONCLUSIONS

Two alternatives were evaluated in some detail in the Proposed Center Hill Dam Seepage Rehabilitation Environmental Assessment, dated July 2005. These were No Action and Grouting. The No Action alternative is not considered feasible for many reasons, but was carried throughout the document as a baseline for comparison and to comply with NEPA. That EA resulted in a signed Finding of No Significant Impact (FONSI) on July 17, 2005. The preferred alternative as listed in that EA and signed FONSI is to inject grout in a grout line on both sides of the dam.

This Environmental Assessment Supplement was completed to evaluate the new alternative (Grouting and Cut-off Walls) along with the No Action and Grouting alternatives. This EA Supplement revealed only minor onsite impacts from either alternatives 2 (Grouting) or 3 (Grouting and Cut-off Walls). Sound engineering practices and environmental protection schemes would be in the plans and specifications to avoid adverse impacts. However, Alternative 3 represents a more effective alternative to controlling seepage at Center Hill Dam.

9.0 Literature Cited

Element Occurrences by Quad. TDEC Division of Natural Heritage. ONLINE. December 2004 Available: http://www.tennessee.gov/environment/nh/qq/

US Census Bureau. Information available at website: http://quickfacts.census.gov.

Denton, Gregory M; Vann, April D.; and Wang, Sherry H. *The Status of Water Quality in Tennessee*. 2002 305 (B) Report. Online. Available: http://www.tennessee.gov/environment/wpc/305b/

Environmental Assessment for the Continued Operation, Maintenance, and Management of J. Percy Priest Dam and Reservoir. U.S. Army Corps of Engineers, Nashville District. February 1987.

Final Version 2002 305(d) List. Tennessee Department of Environment and Conservation. January 2004.

Hauser, Gary E. (Loginetics, Inc.) for the US Army Corps of Engineers, Nashville District. Center Hill Tailwater Modeling for Minimum Flow Evaluation, Preliminary Draft. April 2004

Operational Management Plan, Center Hill Lake, Part I; U.S. Army Corps of Engineers, Nashville District. October 1990.

Operational Management Plan, Center Hill Lake, Part II; U.S. Army Corps of Engineers, Nashville District. October 1990.

Schonian, Erich and Naudts, Alex. *Bitumen – Hot Bitumen Grouting-Rediscovered.* Special Print, vol. 65, 2003. pp.118-123, 178-183.

Williams, Dena. Personal Communication on recreational visitation and benefits at Center Hill Lake. January 14th, 2005

10.0 List of Preparers

Chip Hall, Biologist
EA Preparation

Rob Karwedsky, Archeologist
Cultural Resources Review

Kim Franklin, Biologist
EA Review

Ray Hedrick, Biologist
EA/FONSI Independent Technical Review

Appendix A

Scoping Letter, Mailing List, and Responses

DEPARTMENT OF THE ARMY
NASHVILLE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1070
NASHVILLE, TENNESSEE 37202-1070

February 8, 2006

IN REPLY REFER TO
Project Planning Branch

TO ALL INTERESTED PARTIES:

The Corps of Engineers, Nashville District, is preparing an Environmental Assessment (EA) related to proposed dam rehabilitations at Center Hill Dam, near Cookeville, Tennessee.

Center Hill Dam has a long history of foundation seepage through both the right abutment and left rim due to large solution features within the limestone formations. The Corps of Engineers is studying the possible impacts of various alternatives to control the seepage and prevent potential future damage to the structure. In July, 2005, an Environmental Assessment (EA), evaluating grouting alternatives to control the seepage, was completed. That EA resulted in a signed Finding of No Significant Impact (FONSI) on July 17, 2005. The preferred alternative as listed in that EA and signed FONSI is to inject grout in a grout line on both sides of the dam.

During the design of the grouting alternative, a more effective remediation treatment was identified. This treatment consists of grouting, with a combination of bitumen and conventional grout, the left and right abutments (earthen part of the dam), in combination with grouting the foundation of the dam and constructing cut-off walls along the earthen portion of the main dam and along the fuse plug (saddle) dam. This would require a larger staging area and coffer dams constructed at the saddle dam. Therefore a Supplemental EA is being prepared. The alternatives being evaluated are:

1) No Action - All current operations would continue and no construction would take place.

2) Grouting, as described in the July 2005, Center Hill Dam Seepage Rehabilitation EA and signed FONSI.

3) Grout as described in alternative 2, in combination with constructing cut-off walls along the earthen portion of the main dam and the Fuse-plug (Saddle) Dam and grouting of the foundation along the length of the main dam.

By way of this letter, we are soliciting public and agency comments concerning environmental issues that should be addressed in the course of the NEPA process. We encourage comments not only about the immediate area of the project, but also of plans or proposals for any other development that may impact or influence resources within the proposed project area.

This letter also serves to initiate the public involvement requirements of Section 106 of the National Historic Preservation Act of 1966, as amended. Section 106, implemented by regulations at 36CFR800, requires the Corps of Engineers to consider the effects of its undertakings on historic properties. If required, appropriate architectural and archeological investigations will be conducted within those areas affected by the proposed activities and resulting findings would be coordinated with the Tennessee State Historic Preservation Officer and other offices as necessary.

Maps of the proposed project area are enclosed for your benefit. If you have any information, comments, or questions, please contact Chip Hall by writing to the above address or calling (615) 736-7666. Please submit your comments no later than 30 days from the above date, to assure evaluation and inclusion in the process. Your participation is appreciated.

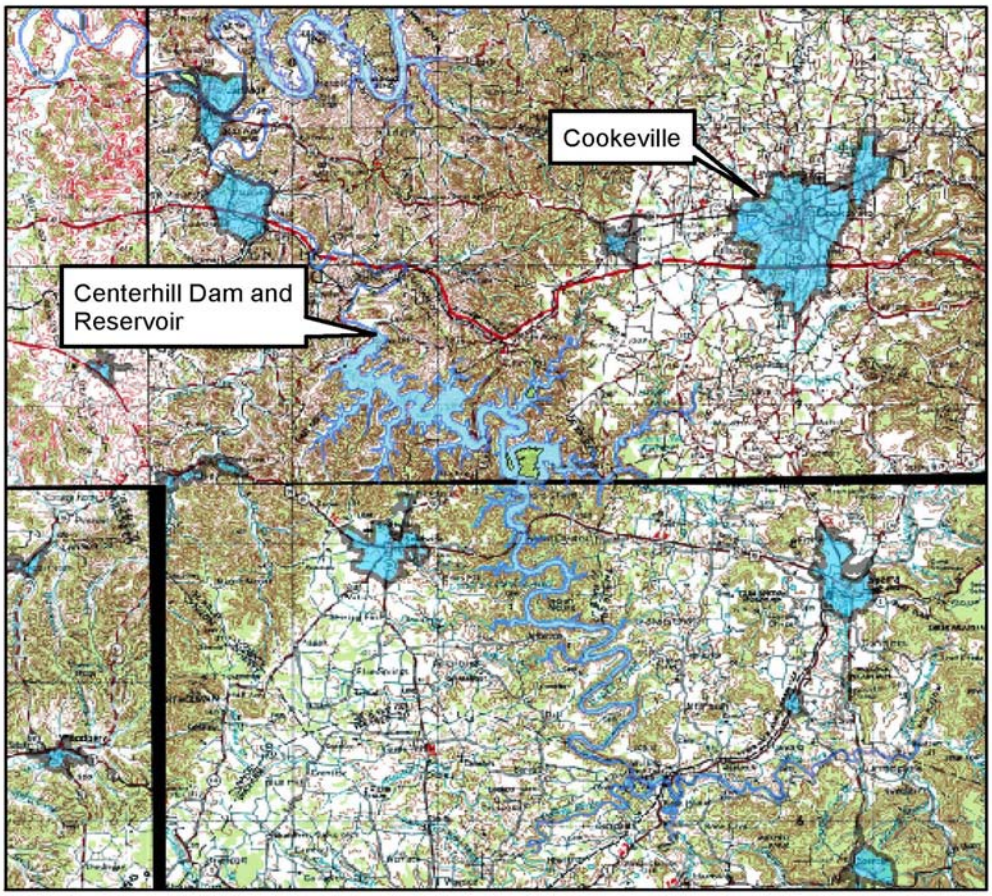
Sincerely,

Douglas L. Radley

Enclosure

Douglas L. Radley, AICP
Chief, Project Planning Branch

Center Hill Dam and Reservoir



USGS Nashville, 1:250,000 QUAD
USGS Corbin, 1:250,000 QUAD
USGS Columbia, 1:250,000 QUAD
USGS Chattanooga, 1:250,000 QUAD

0 3.5 7 14 Miles

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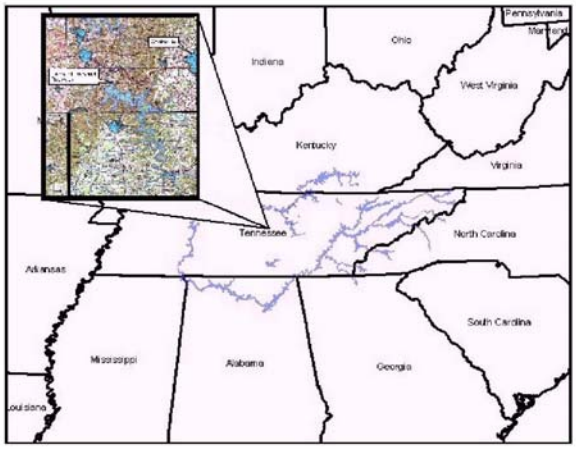
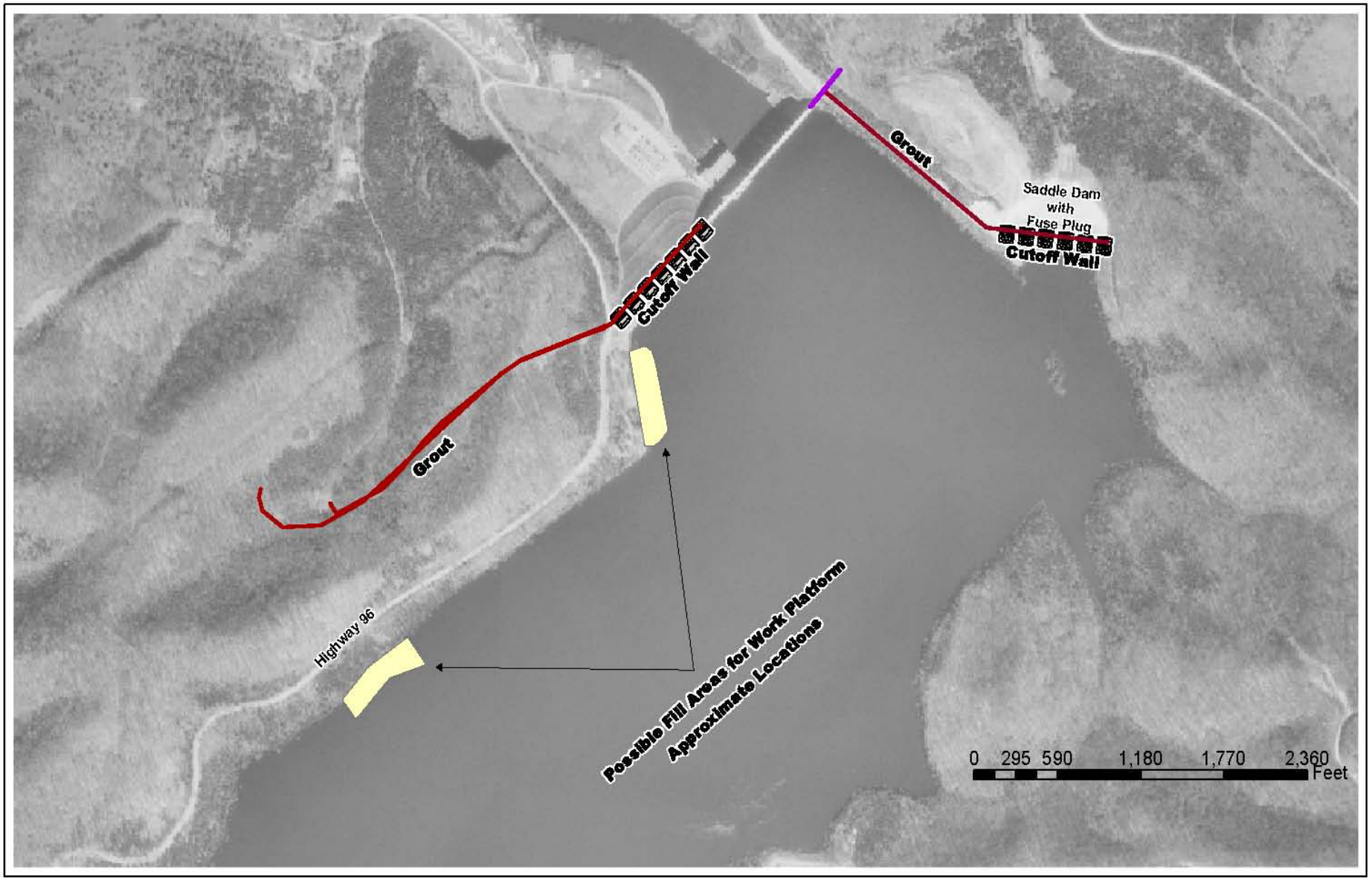


Proposed Site Plan

For Center Hill Dam Seepage Rehabilitation



TWRA NEPA Contact
Mr. Rob Todd
P. O. Box 40747
Nashville, TN 37204

Ms. Ann Murray
Tennessee Conservation League
300 Orlando Avenue
Nashville, TN 37209

Carol Martin
115 Lakewood Circle
Smyrna, TN 37167

TDEC - Mr. Dan Eagar
WPC-7th Floor
L&C Annex
Nashville, TN 37243-1534

Natural Resources Cons. Svc.
State Conservationist
Room 675 U.S. Courthouse
801 Broadway
Nashville, TN 37203

Tennessee Valley Authority
Mr. Jon M. Loney
Environmental Management
400 W. Summit Hill Drive
Knoxville, TN 37902-1499

Tennessee State Planning Office
307 John Sevier Building
500 Charlotte Avenue
Nashville, Tennessee 37219-5082

TN Department of Agriculture
Mr. Louis Buck, Deputy Commissioner
Ellington Agricultural Center
Box 40627
Nashville, Tennessee 37204

TN Dept of Transportation (TDOT)
Mr. Glen Beckwith, Planning Div
Suite 900, James Polk Building
Nashville, TN 37243-0334

USFWS
Mr. Lee Barclay
446 Neal Street
Cookeville, TN 38501

Mr. Herbert Harper, THC SHPO
Attn: Mr. Joe Garrison
Clover Bottom Mansion
2941 Lebanon Road
Nashville, TN 37243-0442

TDEC Environmental Policy Office
21st Flr., L&C Tower, 401 Church Street
Nashville, TN 37243-0454

Mr. Reggie Reeves
TDEC Division of Natural Heritage
8th Floor, L&C Tower
401 Church Street
Nashville, TN 37243

Farm Services Agency
Mr. David McDoyle, Executive Director
579 US Courthouse
Nashville, TN 37203

Environmental Review Coordinator
Division of Ecological Services
TN Dept of Env. & Conservation
8th Floor, L&C Tower, 401 Church St.
Nashville, Tennessee 37243-0447

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Rachel Jackson Building, 7th Floor
320 6th Avenue North
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TDEC Division of Water Pollution Control
7th Floor, L&C Tower
401 Church Street
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6th Floor, L&C Tower
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Division of RH
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Attorney General And Reporter
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Dorene Bolze
Harpeth River Watershed Assn.
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Barry Sulkin
Nashville, TN

Tom Heineke
Heineke & Associates
Bartlett, TN

Ernie Paquette
Nashville, TN

D W Couts
Springfield TN

Gullett, Sanford, Robinson & Martin
ATTN: Dan Haskell
Nashville, Tennessee

Donald N. Jones
Nashville, Tennessee

Sam Fenimore
Brentwood, Tennessee

Key Financial, Inc.
ATTN: Zack Jones
Nashville, Tennessee

Jay Clementi
Game Fair Ltd.
Nashville, Tennessee

Juni Fisher
Franklin, Tennessee

Charles R. Miller

Franklin, Tennessee

Tim Johnson
Nashville, Tennessee

Wendy Smith, Director
World Wildlife Fund
Southeast Rivers and Streams Project
Nashville, TN

Jim Catino
Arista Nashville
Nashville, Tennessee

John Cliff
Franklin, Tennessee

Jackson Harris
Nashville, Tennessee

Sally Rollins Palmer
Columbia, TN

Dr. Richard Davis
Nashville, Tennessee

Roger Guth
Brentwood, Tennessee

Gary Kelley
Nashville, TN

Spencer Elrod
Nashville, TN

Gil Lackey
Nashville, TN

Jack Brown
Old Hickory, Tennessee

Jeff Barrrett – MTFF Conservation Chairman
Franklin, TN

Jeff Wade
Kingston, TN

Tim Dunn
Resource Managers Office
Center Hill Lake

Mr. Kenneth Blanchard
Lt. Governor
Absentee – Shawnee tribe of Oklahoma
Shawnee, OK

Smithville Review
Smithville, TN

Herald Citizen
Cookeville, TN

William Federhofer
Louisville, Kentucky

Middle Tennessee Times
Smithville, TN

Robert M. Koehler
Louisville, Kentucky

Kim Trevathan
Rockford, TN

Bernard J. Blau
Jolly, Blau, Kriege & Turner, P.L.L.C.
Cold Spring, Kentucky

Barry Morris, President
Louisville Chapter Trout Unlimited
Louisville, Kentucky

Tim Guilfoile
7971 Kimbee Drive
Cincinnati, OH 45244

Lee Squires
Louisville, Kentucky

Gary Wisniewski
Florence, KY

Michael Arnold
Highland Heights, KY

Steve Moermond
Covington, KY

Ron Kilmer
Walton, KY

Daniel Salvi
West Chester, OH

Merle Olmsted
Walton, KY

Joe Jackman
Union, KY

James E. Patrick
Covington, KY

Larry Drake
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Alexandria, KY

Tom Rust
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Kevin Bremer
Villa Hills, KY

Aaron McDaniel
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Dean Moby
Covington, KY

Clinton Gray
Louisville, KY

Art Vernon
Florence, KY

Mike Glindmeyer
Burlington, KY

Jim Blasdel
Burlington, KY

James Wilmoth
Stamping Ground, KY

Dave DeWolfe
Florence, TN

Mike Groeschon
Cold Spring, KY

Judith Huseman
Lakeside Park, KY

Scott Spilla
Independence, KY

Tom Gier
Fort Wright, KY

Tom Owen
Independence, KY

Dan Dykes
Alexandria, KY

Ed Jody
Covington, KY

Francis Trambarger
Cincinnati, OH

Jack Randall
Fort Mitchell, KY

Harry Leidy III
Florence, KY

Michael Hinninger
Cincinnati, OH

Morris F. Cecil
Park Hills, KY

Mark England
Erlanger, KY

Lanny Setters
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Daniel Dykes
Alexandria, KY

Dave Barnett
Cincinnati, OH

Evelyn Trambarger
Cincinnati, OH

Tom Garner
Covington, KY

Craig Troescher
Cincinnati, OH

Scott Reusing
Newport, KY

Tom Keener
Southgate, KY

Brian Bamberger
Edgewood, KY

Mel Whitehead
Southgate, KY

Richard Bushman
Walton, KY

Hal Burch
Cincinnati, OH

John Novak III
Edgewood, KY

Frank Reusing
Newport, KY

David Campbell
Goshen, KY

Ginger Novak
Edgewood, KY

Alex Lockstead
Burlington, KY

D Willmoth
Cold Spring, KY

Robert Brock
Richmond, KY

Richard Kordal
Cincinnati, OH

Steve Haubner
Falmouth KY

John Stevie
Taylor Mill, KY

Joseph Mohlenkamp
Cincinnati, OH

Gary Turney
Florence, KY

Paul Stegeman
Cold Spring, KY

Don Wilmoth
Cold Spring, KY

Mary Stegeman
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Emmet Boyers
Alexandria, KY

Cheryl Blau
Fort Thomas, KY

Keith Haungs
Cincinnati, OH

Chuck Norris
Florence, KY

J. Michael Noll
Covington, KY

Erik S. Kousen
Burlington, KY

Bryan
Verona KY

Steve Perry
Cincinnati, OH

Paul J. Dusing
Florence, KY

Joseph Melching
Burlington, KY

Don Becher
Park Hills, KY

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
NASHVILLE, TENNESSEE 37243-0435

JAMES H. FYKE
COMMISSIONER

PHIL BREDESEN
GOVERNOR

February 13, 2006

Mr. Chip Hall
Department of Army
Nashville District, Corps of Engineers
P.O. Box 1070
Nashville, TN 37202-1070

RE: Center Hill Dam Environmental Assessment

Dear Mr. Hall,

The Department of Environment and Conservation received information on the above-referenced project dated February 8, 2006 (received February 9, 2006). The Department will review this material and comment as appropriate.

If you have any questions, please contact our Environmental Policy Office at (615) 532-0929.

Sincerely,

Robin Cathcart
Environmental Policy Office

cc: File 06-016

TENNESSEE HISTORICAL COMMISSION
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
2941 LEBANON ROAD
NASHVILLE, TN 37243-0442
(615) 532-1550

February 15, 2006

Mr. Douglas Radley
U.S. Army Corps of Engineers, Nashville District
Project Planning Branch
Post Office Box 1070
Nashville, Tennessee 37202-1070

RE: COE-N, CENTER HILL DAM REHABILITATION, COOKEVILLE,
PUTNAM COUNTY

Dear Mr. Radley:

Pursuant to your request, this office has reviewed documentation concerning the above-referenced undertaking received Friday, February 10, 2006. This is a requirement of Section 106 of the National Historic Preservation Act for compliance by the participating federal agency or applicant for federal assistance. Procedures for implementing Section 106 of the Act are codified at 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739).

Considering available information, we concur that the project as currently proposed will not adversely affect any property that is eligible for listing in the National Register of Historic Places. Therefore, this office has no objection to the implementation of this project. Please direct questions and comments to Jennifer M. Barnett (615) 741-1588. We appreciate your cooperation.

Sincerely,

Herbert L. Harper

Herbert L. Harper
Executive Director and
Deputy State Historic
Preservation Officer

HLH/jmb

COOKEVILLE ENVIRONMENTAL FIELD OFFICE
TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
1221 SOUTH WILLOW AVENUE
COOKEVILLE, TENNESSEE 38506
1-(888)-891-8332
(931)-432-4015

February 15, 2006

Mr. Douglas L. Radley
Department of the Army
Nashville District, Corps of Engineers
P.O. Box 1070
Nashville, TN 37202-1070

RE: Environmental Assessment
Center Hill Dam

Dear Mr. Radley,

The Division of Underground Storage Tanks, Cookeville Field Office has reviewed the above referenced document. According to our files, no UST systems are located in the work areas indicated. As a result the Division has no further comment concerning this project.

Elwin Hannah
Cookeville Field Office Manager
Division of Underground Storage Tanks

C: Lisa Pugh
Cheryl White

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
Recreation Educational Services
10th floor - L&C Tower
401 Church Street
Nashville, Tennessee 37243

February 27, 2006

Mr. Douglas L. Radley, AICP
Chief, Project Planning Branch
Department of the Army
Nashville District, Corps of Engineers
P.O. Box 1070
Nashville, TN 37202-1070

RE: Environmental Assessment (EA) related to proposed dam rehabilitation at Center Hill Dam near Cookeville, Tennessee.

Dear Mr. Radley:

Thank you for including this agency on your review contact list for the above referenced document.

After a research of our office's files, we can locate no occasion where a grant administrated by this division would be impacted by the proposed dam rehabilitation at Center Hill Dam. Therefore, we have no involvement in the subject area from a state or federal level.

Sincerely,

Mark Tummons, CPRP
Director

MT/lh

Copy: Mr. Wayne Easterling, COE, Nashville District

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
Recreation Educational Services
10th floor - L&C Tower
401 Church Street
Nashville, Tennessee 37243

February 27, 2006

Mr. Douglas L. Radley, AICP
Chief, Project Planning Branch
Department of the Army
Nashville District, Corps of Engineers
P.O. Box 1070
Nashville, TN 37202-1070

RE: Environmental Assessment (EA) related to proposed dam rehabilitation at Center Hill Dam near Cookeville, Tennessee.

Dear Mr. Radley:

Thank you for including this agency on your review contact list for the above referenced document.

After a research of our office's files, we can locate no occasion where a grant administrated by this division would be impacted by the proposed dam rehabilitation at Center Hill Dam. Therefore, we have no involvement in the subject area from a state or federal level.

Sincerely,

Mark Tummons, CPRP
Director

MT/lh

Copy: Mr. Wayne Easterling, COE, Nashville District
Chip Hill

Hall, Chip W LRN

From: Rob Todd [Rob.Todd@state.tn.us]
Sent: Thursday, March 09, 2006 9:11 AM
To: Hall, Chip W LRN
Subject: TWRA Comments Regarding Proposed Dam Rehabilitations at CenterHill Dam

Attachments: Chip Hall - Draft EA Center Hill Dam Rehabilitations - USACE - Comment Letter - 3-8-2006.doc

Chip Hall - Draft EA Center Hi...

Mr. Hall:

Thank you for providing me with your e-mail address. The attached Word file contains the comments by the Tennessee Wildlife Resources Agency regarding the proposed dam rehabilitations at Center Hill Dam. Thank you for the opportunity to comment.

Robert M. Todd
Tennessee Wildlife Resources Agency
Environmental Services Division
Ellington Agricultural Center
P.O. Box 40747
Nashville, TN 37204
Phone: 615-781-6572
Fax: 615-781-6667
E-mail address: Rob.Todd@state.tn.us

TENNESSEE WILDLIFE RESOURCES AGENCY

ELLINGTON AGRICULTURAL CENTER
P. O. BOX 40747
NASHVILLE, TENNESSEE 37204

March 8, 2006

Chip Hall
U.S. Army Corps of Engineers
Nashville District
Project Planning Branch
P. O. Box 1070
Nashville, TN 37202-1070

Re: Draft Environmental Assessment
Applicant: U.S. Army Corps of Engineers
Proposed Dam Rehabilitations at Center Hill Dam
Center Hill Reservoir

Dear Mr. Hall:

The Tennessee Wildlife Resources Agency has significant concerns regarding the proposed project to conduct rehabilitation measures to control seepage that is occurring at Center Hill Dam and to prevent potential future damage to the dam structure. As you are aware, Center Hill Reservoir and the Caney Fork River provide valuable fishery resources to the citizens of Tennessee. The Caney Fork River, below Center Hill Dam, is one of the most valuable trout fishing resources in the state and provides an economic resource to the surrounding community. The Tennessee Wildlife Resources Agency is concerned that when the proposed rehabilitation measures are complete there will be a loss of continuous in-stream flow associated with these seepages that may impact the trout fishery that exists below Center Hill Dam. The existing trout fishery is dependent upon the coldwater releases and seepage from Center Hill Dam; therefore it is our opinion that during the NEPA process to determine alternatives to rehabilitate the dam, mitigation for potential impacts to the existing valuable trout fishery due to the loss of these in-stream flows should be included in this process.

Also, during the grouting process, all necessary measures should be taken to insure that the fresh grout, which is toxic to aquatic resources, does not impact the aquatic resources inhabiting either Center Hill Reservoir or the Caney Fork River.

Thank you for the opportunity to comment.

Sincerely,

Robert M. Todd

Robert M. Todd
Fish and Wildlife Environmentalist

cc: Bobby Brown, Region III Habitat Biologist
John Mayer, Region III Manager
USFWS, EPA, WPC

Appendix B

Public Notice and 404 (b)(1) Evaluation

US Army Corps of Engineers

Nashville District

Public Notice

Public Notice No. PM-P-06-01 Date: March 21, 2006

Comments To:
Nashville District Corps of Engineers
Planning Branch (PM-P)
P.O. Box 1070
Nashville, TN 37202-1070
ATTN: Mr. Chip Hall
Phone: 615-736-7666

Tennessee Division of Water Pollution Control
Natural Resources Section
401 Church Street; 7TH Floor L & C Annex
Nashville, TN 37134-0343
ATTN: Mr. Dan Eager
Phone: 615-532-0708

PUBLIC NOTICE

US ARMY CORPS OF ENGINEERS

PROPONENT: US Army Corps of Engineers, Nashville District

SUBJECT: Proposed Placement of Fill Material in Association with Dam Repairs at Center Hill Dam, Caney Fork River Mile 26.6, (36° 05' 50" N; 85 °, 49', 34" W) Center Hill Dam Quadrangle.

TO ALL CONCERNED: In compliance with Section 404 of the Clean Water Act (CWA) PL 92-500, notice is hereby given that the Nashville District Corps of Engineers proposes to place fill material along the upstream face of the dam and along the adjacent shoreline on the left descending bank (Eisenhower Park) to create a work platform in connection with necessary dam repairs. In addition, a coffer cell dam would be constructed in the lake in front of the Center Hill Saddle Dam with Fuse Plug. This coffer dam would be removed after work is completed. Before the fill can be undertaken, certification must be obtained from the State of Tennessee pursuant to Section 401(a)(1) of the CWA, that applicable water quality standards will not be violated. By copy of this notice, the Corps of Engineers hereby applies for the required certification.

WATERSHED and LOCATION: The proposed project is in the Caney Fork River Watershed, HUC TN05130108, Caney Fork River Mile 26.6, (36° 05' 50" N; 85 °, 49', 34" W) Center Hill Dam Quadrangle, Lancaster, Dekalb County, Tennessee (USGS Center Hill Dam, Tennessee 7.5 Minute Series Quadrangle).

AUTHORITY and BACKGROUND: The Flood Control Act of 1938 authorized initial dam construction and supplementing authorizations authorized the Chief of Engineers to construct, maintain, and operate public park and recreational facilities and to permit construction, maintenance and operation of such facilities. The Federal Water Project Recreation Act of 1965 established development of the recreational potential at federal water resource projects as a full project purpose. The Fish and Wildlife Coordination Act (16 USC 661) and the Fish and Wildlife Conservation Act of 1980 (16 USC §§ 2901 – 2911) effectively added fish and wildlife

management as a project purpose. The Clean Water Act (33 U.S.C. 1252 § 102(b)) added water quality to the Corps' mission and the River and Harbor Act of 1958 (43 U.S.C. 390b), authorized municipal and industrial water storage in Corps projects and the reallocation of storage.

Center Hill Dam has a long history of foundation seepage problems through both the right abutment and left rim due to large solution features (caves) within the limestone formations. Some risk for dam failure due to seepage problems exists. The proposed work is necessary for the construction requirements to address the seepage problems.

PURPOSE and DESCRIPTION: The purpose of this work is to maintain the safe continued operation of Center Hill Dam. An Environmental Assessment for this work has been prepared and is circulating concurrently with this Public Notice. A copy of this EA can be obtained by contacting Mr. Chip Hall at the address provided below. The dam and associated lake provides millions of dollars of benefits annually in flood damage reduction, hydropower, recreation, fish and wildlife, water quality, and water supply. The project proposes placement of approximately 163,000 cubic yards of clean shot rock along 1,500 linear feet of shoreline on the left rim (Eisenhower Park) to construct a construction work platform that will be used for needed dam repairs. The majority of this material would lie below the normal summer pool. In addition, approximately 1,000 linear feet of coffer dam will be placed in front of the Center Hill Saddle Dam with Fuse Plug to ensure dry working conditions along the right abutment. The coffer dam would be removed after work has been completed. The rock would remain in place after the work is completed as a part of the dam face because it would cause more environmental damage to remove it than it would to leave it once it is in place.

CURRENT SITE CONDITIONS: The current conditions of the project site are described in detail in the Section 404(b)(1) Evaluation. Briefly, the waters have been converted by the impoundment of the reservoir from a riverine to a lake environment. Flows are regulated. The substrate is predominantly bedrock, cobble and gravel, and some sand, silt, and clay. There are no known contaminants including metals and a variety of hazardous and toxic chemicals including PCBs.

ALTERNATIVES: Alternatives studied included No Action, grouting only, and a combination of grouting and cutoff walls. No action and grouting only would not require the construction of the work platform. No Action would ultimately result in the loss of the Center Hill pool and the associated benefits. Grouting only may temporarily slow or even stop the seepage, but is less certain than when used in combination with the construction of cutoff walls.

OTHER CONSIDERATIONS: In addition to consideration of other factors of the public interest, the review process will include application of the guidelines promulgated by the Administrator, Environmental Protection Agency (EPA), under authority of Section 404(b)(1) of the Clean Water Act (40 CFR Part 230). A 404(b)(1) evaluation has been completed and is available for review at the location listed above.

The Corps of Engineers signed a mitigated Finding of No Significant Impact on June 19, 1992 in which it committed to providing alternative minimum flows if the seepage is stopped. The Corps remains dedicated to this commitment and proposes to provide minimum flows below Center Hill Dam by installing a new house generator. This generator would provide flows of

approximately 200 cubic feet per second which, studies have shown to be optimal. It may be able to improve the dissolved oxygen also.

Section 106 of the National Historic Preservation Act requires Federal agencies having direct or indirect jurisdiction over a proposed Federal or federally assisted undertaking to take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register. The State Historic Preservation Officer (SHPO) of Tennessee has been consulted with regards to this undertaking. A single historic property, Center Hill Dam and associated facilities, is located within the project's "area of potential effects." In response to initial project scoping the Tennessee State Historic Preservation Officer (SHPO) noted that the proposed undertaking may affect historic properties. Consequently, and in accordance with requirements at 36 CFR 800.5, an assessment of adverse effects was conducted by the Corps. An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register of Historic Places. Applying the criteria of adverse effect, the Corps concluded that the proposed activities would have no adverse affect on Center Hill Dam. This finding was provided to the Tennessee State Historic Preservation Officer (SHPO) by letter dated February 10, 2006. The SHPO concurred with the Corps' finding by letter dated February 15, 2006.

As identified under the Endangered Species Act, one species of federally listed Threatened or Endangered Species, the gray bat (*Myotis grisescens*) could potentially reside in the area. The gray bat roosts only in caves or cave-like habitats. There are caves located within the area of potential effect. The grouting alternative would affect some of these caves; however these caves do not fit the characteristics of the summer roosting or winter hibernation habitat of the gray bat. The caves or solution features that would be affected by grouting have water flushing through them, originating from the reservoir. Therefore, a Biological Assessment will not be prepared for this species. There are no significant adverse impacts to federally listed species anticipated.

Federal, state and local approvals required for the proposed work include the following:

a. An Aquatic Resources Alteration Permit from the State of Tennessee and in accordance with Section 401(a)(1) of the Clean Water Act.
b. An Underground Injection Control Permit would be required prior to the grouting operations.
c. An NPDES Storm Water Construction Permit would be required prior to beginning construction activities.

PUBLIC PARTICIPATION: An Environmental Assessment (EA), unsigned Finding of No Significant Impact (FONSI), and Preliminary 404(b)(1) Evaluation have been prepared and are being circulated to appropriate agencies, organizations, and the public for review and comment. The EA evaluates the existing environmental conditions and effects of proposed impacts to the region. Also, the EA incorporates environmental commitments and measures to minimize or reduce environmental impacts to riparian and aquatic habitat to the extent feasible including the use of best management practices (BMPs). Responses received during the comment period will be addressed and incorporated into the EA. Copies of the EA package may be obtained by writing or calling the Corps contact indicated below.

Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider this application. Requests for public hearings should be sent to the Corps or TDEC, Water Pollution Control, Natural Resources Section. Requests for public hearings shall state, with particularity, the reasons for holding a public hearing.

Written statements received in this office on or before **April 21, 2006**, will become a part of the record and will be considered in the determination. Any response to this notice should be directed to the U.S. Army Corps of Engineers, Project Planning Branch, Attention: Chip Hall, PO Box 1070, Nashville, TN, 37202-1070, or by calling (615) 736-7666. Comments can also be directed to the Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Natural Resources Section, Attention: Dan Eager, 401 Church Street, 7th Floor L&C Annex, Nashville, TN 37134-0343, or by calling (615) 532-0708.

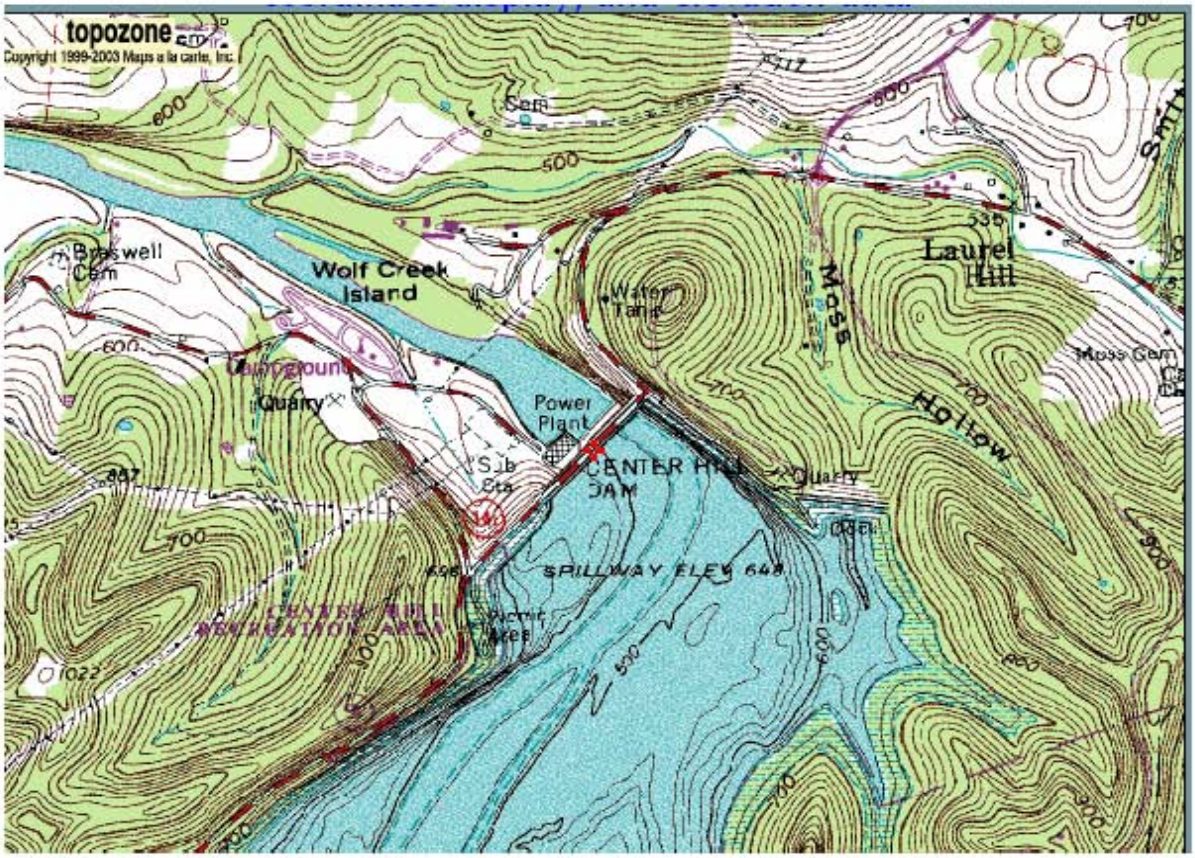


Figure 1

Center Hill Dam, Center Hill Dam Quad

36° 05' 50" N; 85 °, 49', 34" W

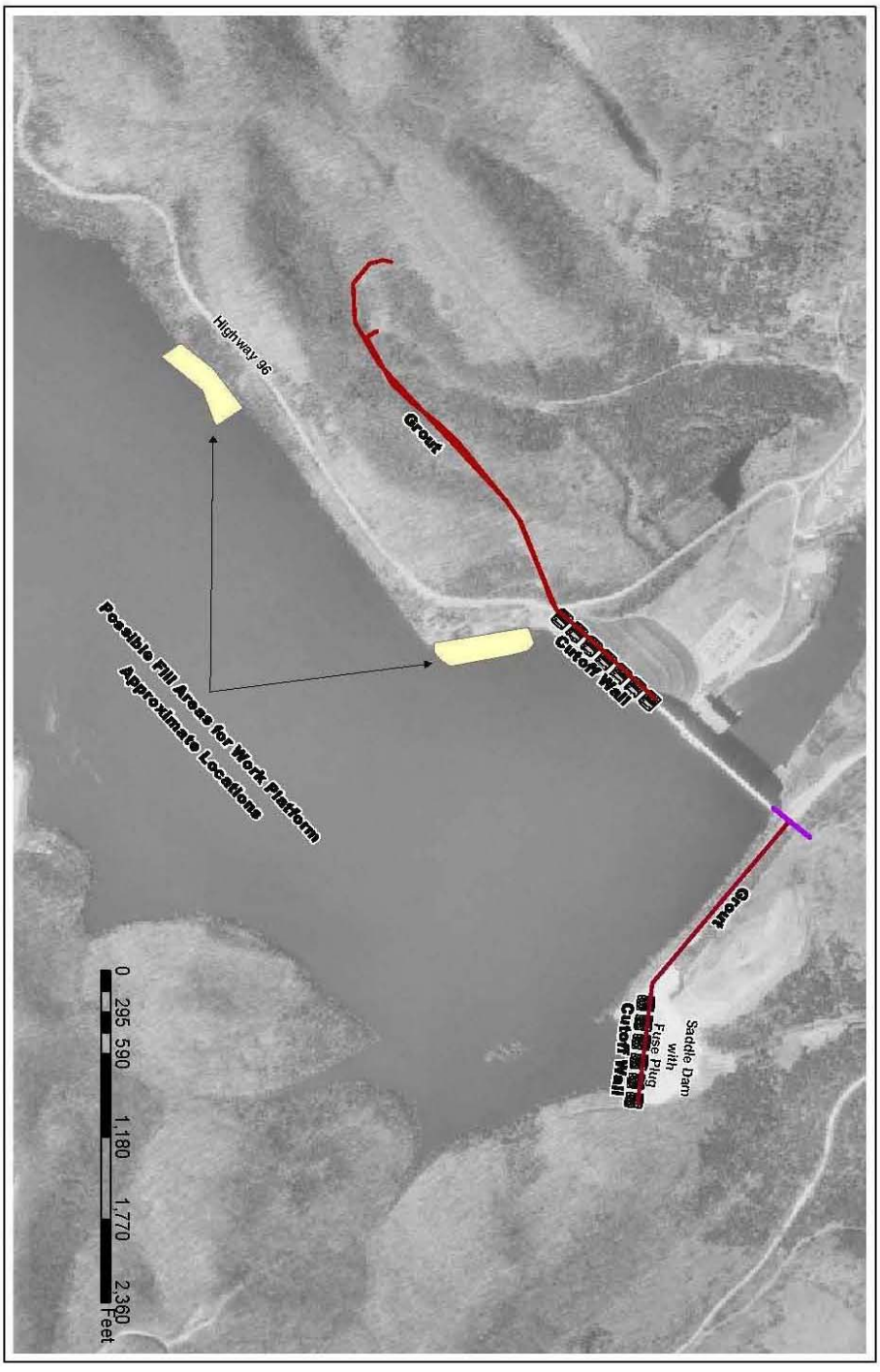
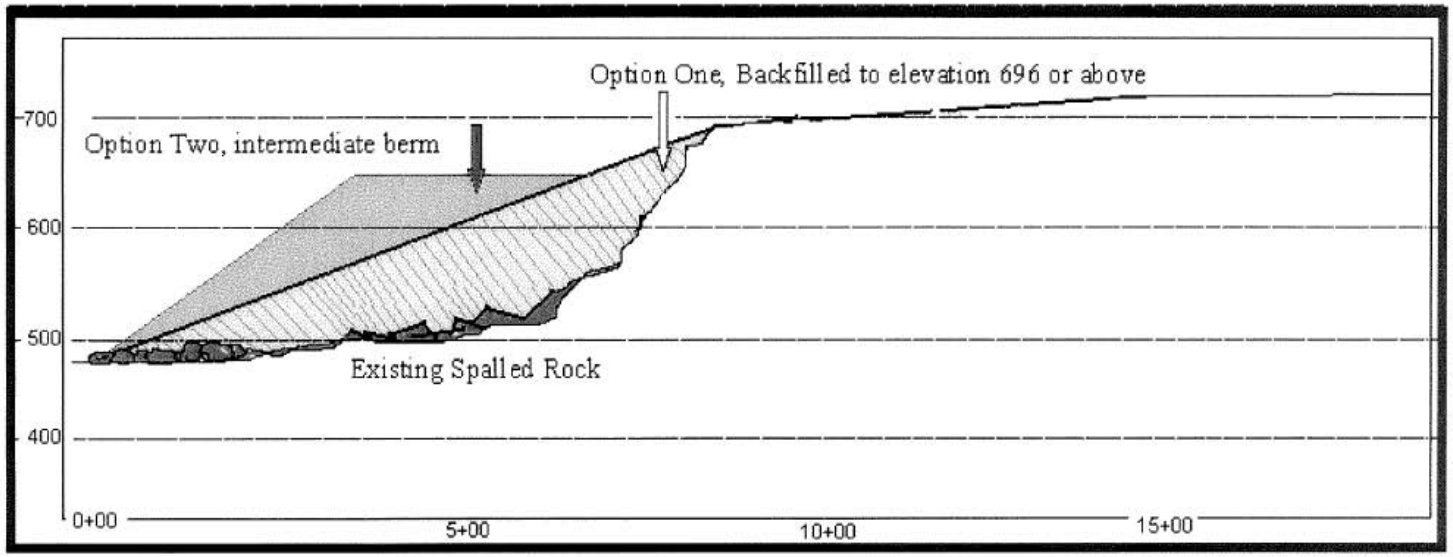


Figure 2

Location of proposed work

Proposed Filling of Eisenhower Park



Typical Section

Eisenhower Park
Proposed Fill Area

Section 404(b)(1) Evaluation

Center Hill Seepage Rehabilitation
Center Hill Lake, Lancaster, TN
Caney Fork River
DeKalb County, TN

SECTION 404 (b) (1) EVALUATION
Center Hill Seepage Rehabilitation
Center Hill Lake, Lancaster, Tennessee
Caney Fork River
DeKalb County, Tennessee

I. PROJECT DESCRIPTION.

a. Location. The proposed project is in the Caney Fork River Watershed, HUC TN05130108, Caney Fork River Mile 26.6, (36° 05' 50" N; 85 °, 49', 34" W) Center Hill Dam Quadrangle, Lancaster, Dekalb County, Tennessee (USGS Center Hill Dam, Tennessee 7.5 Minute Series Quadrangle). Refer to Figure 1 for the general location map.

b. General Description. The purpose of this work is to maintain the safe continued operation of Center Hill Dam. The dam and associated lake provides millions of dollars of benefits annually in flood damage reduction, hydropower, recreation, fish and wildlife, water quality, and water supply. The project proposes placement of approximately 163,000 cubic yards of clean shot rock along 1,500 linear feet of shoreline on the left rim (Eisenhower Park) to construct a construction work platform that will be used for needed dam repairs. The majority of this material would lie below the normal summer pool. In addition, approximately 1,000 linear feet of coffer dam will be placed in front of the Center Hill Saddle Dam with Fuse Plug to ensure dry working conditions along the right abutment. The coffer dam would be removed after work has been completed. The rock would remain in place after the work is completed as a part of the dam face because it would cause more environmental damage to remove it than it would to leave it once it is in place.

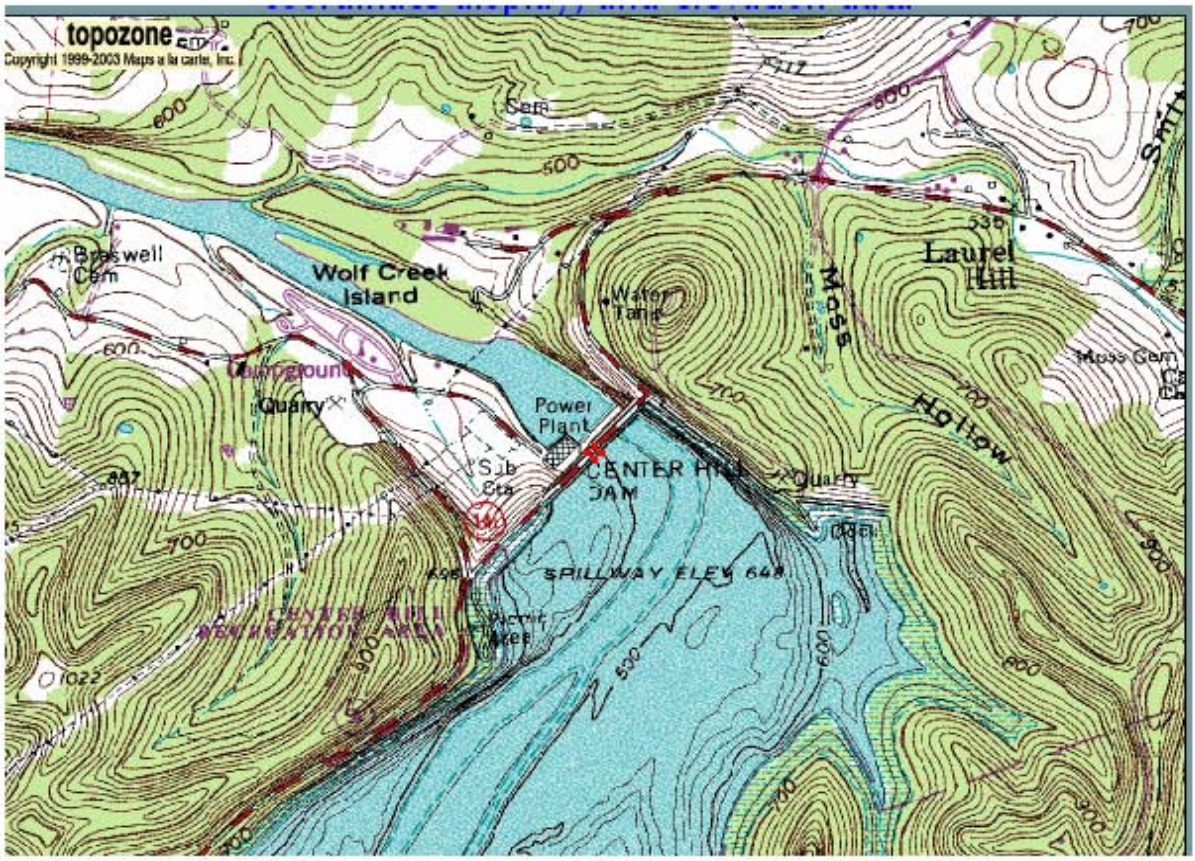


Figure 1 - Project Location Map

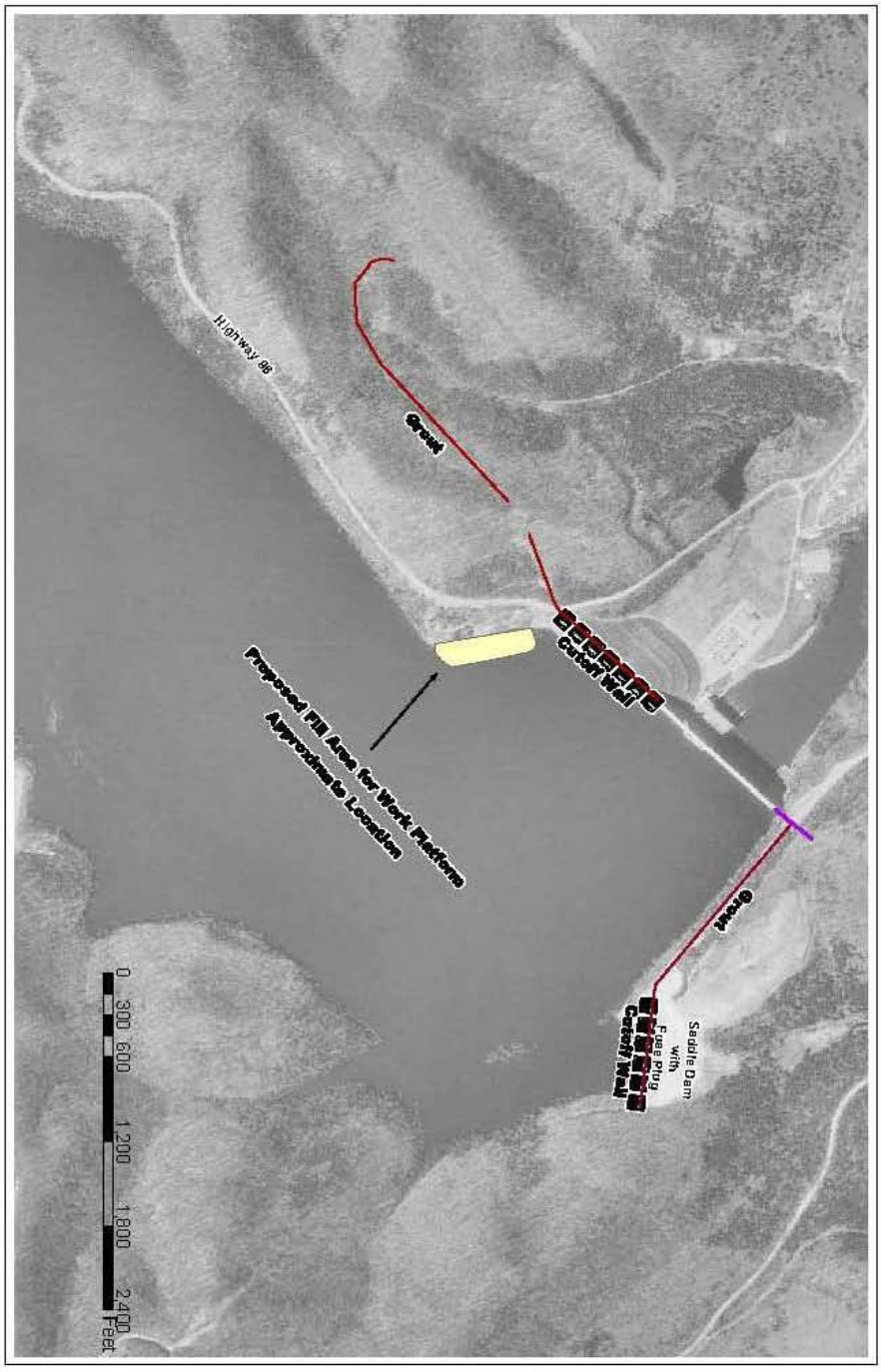

Highway 86
Grout
Proposed Fill Area for Work Platform
Approximate Location
Grout
Saddle Dam
with
Fuse Plug
0
300
600
1,200
1,800
2,400
Feet

Figure 2

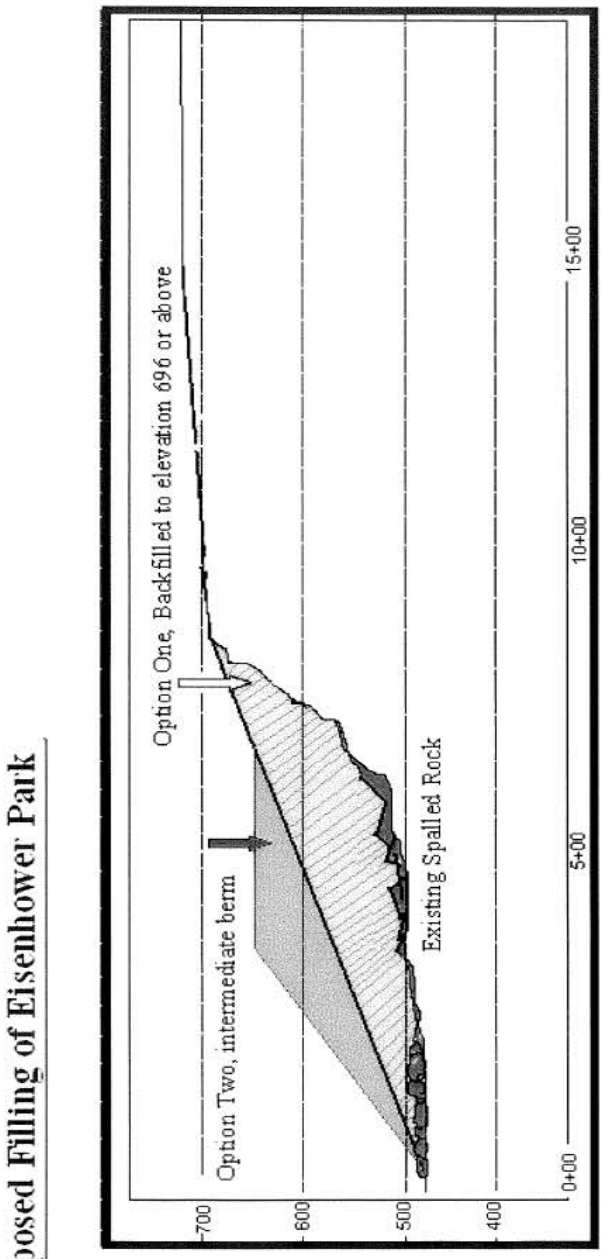

Proposed Filling of Eisenhower Park
Option One, Backfilled to elevation 696 or above
Option Two, intermediate berm
Existing Spalled Rock
700
600
500
400
0+00
5+00
10+00
15+00
Typical Section

Figure 3

c. Authority and Purpose. The Center Hill project was authorized by the Flood Control Act approved June 28, 1938 (Public No. 761, 75th Congress, 3d session). This study is being conducted under the Center Hill Project's original authority.

d. General Description of Dredged or Fill Material.

(1) General Characteristics of Material. Fill will consist of clean shot rock. Coffer cells will consist of metal cylinders filled with clean shot rock.

(2) Quantity of Material. 163,000 cubic yards of clean shot rock would be placed along 1,500 linear feet of shoreline on the left rim. The size of the platform will be approximately 1 acre. Approximately 1,000 linear feet of coffer dam will be placed in front of the Center Hill Saddle Dam with Fuse Plug.

(3) Source of Material. The shot rock would be provided by a local supplier.

e. Description of the Proposed Discharge Site.

(1) Location. The proposed work pad is located adjacent to the shoreline on the left rim (Eisenhower Park). The coffer dam will be located just upstream of the saddle dam (see Figure 2).

(2) Size. The work pad will be approximately 1 acre in size along approximately 1,500 linear feet of shoreline. The coffer dam would be approximately 1,000 linear feet

(3) Type of Site. Lake bottom.

(4) Type of Habitat. The substrate is mainly rock and hard clay with sparse gravel and cobble.

(5) Timing and Duration of Discharge. The exact time of the construction has not been determined, but may occur in middle to late summer or in the fall after the water begins to be drawn down to the winter storage level.

f. Description of Disposal Method. Sound environmental and engineering practices commonly referred to as Best Management Practices (BMPs) would be followed during all phases of the construction process. To construct the work pad, shot rock would likely be pushed into place from the land. The coffer dam would be constructed by lowering the coffer cells in place and then back filling them with clean shot rock.

II. Factual Determinations.

a. Physical Substrate Determinations.

(1) Substrate Elevation and Slope. The work pad would extend from above ordinary high water (elevation 648) to approximately elevation 480.

(2) Sediment Type. The existing substrate is bedrock and hard clay with scattered rocks and gravel.

(3) Dredged/Fill Material Movement. No material will be dredged.

(4) Physical Effects on Benthos. Most of the area that the work pad will occupy will be covered. This area is small in comparison to available habitat of Center Hill Reservoir. Installation of the work pad will have little or no impact on benthos of Center Hill Reservoir. The footprint of the Coffer dam will be temporarily covered. Once construction is complete, the coffer dam will be removed and the area will stabilize. Installation and removal will have very little effect on the benthos of Center Hill Reservoir

(5) Other Effects. No other effects are anticipated.

(6) Actions Taken to Minimize Impacts. BMPs will be enforced to limit any water quality problems.

b. Water Circulation, Fluctuation, and Salinity Determinations. Water chemistry, odor, taste, dissolved oxygen levels, nutrients, and eutrophication would not be significantly affected by the installation. Any minor effects would stabilize to preconstruction ranges quickly when construction activities were complete. Current patterns, river flow and velocity and hydrologic regime would not be affected. There would be no discernable fluctuation of pool level and no significant project-induced effects during high water periods. Salinity is not a consideration. Loss of floodwater storage capacity would also be insignificant.

(1) Water. Center Hill Lake maintains a regulated freshwater pool. Monitoring has identified generally very good water quality.

(2) Current Patterns and Circulation. There is very little circulation in this area. The dam makes the pool relatively stable and there is no appreciable current.

(3) Normal Water Fluctuations. The ordinary high water is approximately elevation 648' msl and the top of the flood pool is elevation 685' msl. Water levels can fluctuate between approximately 631' and 648' msl.

(4) Salinity Gradients. N/A

(5) Actions That Will Be Taken to Minimize Impacts. During construction BMPs would be in place. After construction is complete there would be little difference between future flow patterns and those that currently exist.

c. Suspended Particulate/Turbidity Determinations.

(1) Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Site. Turbidity levels would remain essentially the same. After the work pad is in place the shot rock may result in a decrease in suspended particulates originating from the substrate. Temporarily during construction, turbidity levels would be increased.

(2) Effects on Chemical and Physical Properties of the Water Column. The effect on the chemical and physical properties of the Caney Fork River would be insignificant.

d. Contaminant Determinations. The sediment quality of Center Hill Lake is generally good. No known contaminants exist in the project area.

e. Aquatic Ecosystem and Organism Determinations.

(1) Effects on Plankton. None.

(2) Effects on Benthos. None.

(3) Effects on Nekton. None.

(4) Effects on Aquatic Food Web. None.

(5) Effects on special Aquatic Sites. None.

(6) Threatened and Endangered Species. There are no known Federally listed Threatened or Endangered Species present at the site.

(7) Other Wildlife. No significant adverse effects to other wildlife are anticipated.

(8) Actions to Minimize Impacts. BMPs will be enforced to minimize any adverse impacts on the environment.

f. Proposed Disposal Site Determinations. No disposal site will be required.

(1) Mixing Zone Determination. N/A.

(2) Determination of Compliance with Applicable Water Quality Standards. The proposed installation would not affect water quality standards.

(3) Potential Effects on Human Use Characteristics. Human use characteristics would not be changed. It is anticipated that the work pad would be used to

increase the size of the adjacent recreation area (Eisenhower Park). If so, the area could have an increased volume of use.

g. Determination of Cumulative Effects on the Aquatic Ecosystem. No adverse cumulative effects to the aquatic ecosystem of the Caney Fork River are anticipated from the proposed project.

h. Determination of Secondary Effects on the Aquatic Ecosystem. No adverse secondary effects to the aquatic ecosystem of the Caney Fork River are anticipated from the proposed project.

III. Findings of Compliance or Non-Compliance with Restrictions on Discharge.

a. Adaptation of the Section 404(b)(1) Guidelines to this Evaluation.

b. Evaluation of Availability of Practicable Alternatives to the Proposed discharge Site Which Would Have Less Adverse Impact on the Aquatic Ecosystem. Several alternatives were studied. The recommended plan has negligible environmental impacts and provides strong economic and recreational benefits.

c. Compliance with Applicable State Water Quality Standards. The proposed plan would be in compliance with all applicable state water quality standards.

d. Compliance with Applicable Toxic Effluent Standard of Prohibition Under Section 307 of the Clean Water Act. The fill operations would not violate Section 307 of the Clean Water Act.

e. Compliance with the Endangered Species Act. As no endangered species are present in the proposed project area a No Effect determination can be supported.

f. Compliance with Specified Protection Measures for Marine Sanctuaries Designated by the Marine Protection, Research, and Sanctuaries Act of 1972. N/A.

g. Evaluation of Extent of Degradation of the Waters of the United States.

(1) Significant Adverse Effects on Human Health and Welfare. The proposed placement of fill material would not result in any significant adverse impacts on human health and welfare, including municipal and private water supplies, recreation and commercial fishing.

(2) Significant Adverse Effects on Life Stages of Aquatic Life and Other Wildlife Dependent on Aquatic Ecosystems. Life stages of aquatic and terrestrial species would not be adversely affected.

(3) Significant Adverse Effects on Aquatic Ecosystem diversity, Productivity, and Stability. No significant adverse effects on aquatic ecosystem diversity, productivity, or stability would occur.

(4) Significant Adverse Effects on Recreational, Aesthetic, and Economic Values. Recreational, aesthetic, and economic values would not be adversely affected.

h. Appropriate and Practicable Steps Taken to Minimize Potential Adverse Impacts of the discharge on the Aquatic Ecosystem. Appropriate steps to minimize potential adverse impacts of the discharge on the aquatic ecosystem entail implementing BMPs as discussed at the TDEC website listed below. http://www.state.tn.us/environment/wpc/sed_ero_controlhandbook/.

i. On the Basis of the Guidelines, the Proposed Disposal Site for the Discharge of Dredged or Fill Material is: specified as complying with the requirements of these guidelines, with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects on the aquatic ecosystem.

FINDING OF COMPLIANCE
FOR
CENTER HILL SEEPAGE REHABILITATION
CENTER HILL LAKE, LANCASTER, TENNESSEE
CANEY FORK RIVER
DEKALB COUNTY, TENNESSEE

1. No significant adaptations of the guidelines were made relative to this evaluation.

2. No open water disposal sites were identified for this project.

3. No dredging would occur.

4. The proposed construction of the work pad and installation of the coffer dam will not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreation and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. The life stages of aquatic life and other wildlife will not be adversely affected. Significant adverse effects on aquatic ecosystem diversity, productivity and stability and recreational, aesthetic and economic values will not occur.

6. On the basis of the guidelines the proposed work pad and coffer dam are specified as complying with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects to the aquatic ecosystem.

Date: _____

_____
Steven J. Roemhildt, P.E.
Lieutenant Colonel
Corps of Engineers
District Engineer